CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/W.No.06/RN/CSR-06/057m/CEMENT/2016-17 Date: 08.06.2016

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
*NAME OF THE WORK	:	Improvements to Roads and at Sarayipalya Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
*REFERENCE	:	BBMP/EE/BTP/WO/15/2016-17 Dated: 30.04.2016
SAMPLE ID	:	Cement – Sample 4
SAMPLE RECEIVED ON	:	04.06.2016
PERIOD OF TESTING	:	04.06.2016 to 08.06.2016

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	30.50 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	150 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	490 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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****

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Job No.: CTCE/BBMP/W.No.06/RN/CSR-06/057m/SAND-Gradation/2016-17 : 08.06.2016

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. R. Nithin,**
No.58, Muneshwara Layout, 5th cross, Bangalore - 91.

*** Name of Work** : Improvements to Roads and at Sarayipalya Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.

Reference : BBMP/EE/BTP/WO/15/2016-17 Dated: 30.04.2016

Technical Reference : IS : 2386 Part 1 - 1963 RA-2007

Sample ID : Fine Aggregates – Sample 4

Sample Received on : 04.06.2016

Date of Testing : 08.06.2016

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	92.00	90-100	90-100	90-100	95-100
2.36	73.00	60-95	75-100	85-100	95-100
1.18	52.00	30-70	55-90	75-100	90-100
600 Micron	23.00	15-34	35-59	60-79	80-100
300 Micron	11.00	5-20	8-30	12-40	15-50
150 Micron	4.20	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

AE 06 n/a

Remarks : This sample is under Zone-I specific limits.

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Job No.: CTCE/BBMP/W.No.06/RN/CSR-06/057m/AGG/GR/2016-17 : 08.06.2016

TEST REPORT ON DETERMINATION GRADATION OF COARSE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. R. Nithin,**
No.58, Muneshwara Layout, 5th cross, Bangalore - 91.

*** Name of Work** : Improvements to Roads and at Sarayipalya Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.

Reference : BBMP/EE/BTP/WO/15/2016-17 Dated: 30.04.2016

Technical Reference : IS : 2386 Part 1 -1963 RA-2007

Sample ID : Coarse Aggregates (40mm) - Sample 4

Sample Received on : 04.06.2016

Date of Testing : 08.06.2016

Total Wt. of Aggregates in gms= **7000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)	
		Graded	Single Sized
80	100	100	-
63	100	-	100
40	97.57	95-100	85-100
20	40.43	30-70	0-20
10	13.43	10-35	0-5
4.75	3.43	0-5	-

* Information is furnished by the Customer/Representative

Remarks : This sample is under Graded specific limits.

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Job No.: CTCE/BBMP/W.No.06/RN/CSR-06/057m/AGG/GR/2016-17 : 08.06.2016

TEST REPORT ON DETERMINATION GRADATION OF COARSE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. R. Nithin,**
No.58, Muneshwara Layout, 5th cross, Bangalore - 91.

*** Name of Work** : Improvements to Roads and at Sarayipalya Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.

*** Reference** : BBMP/EE/BTP/WO/15/2016-17 Dated: 30.04.2016

Technical Reference : IS : 2386 Part 1 -1963 RA-2007

Sample ID : Coarse Aggregates (20mm) – Sample 4

Sample Received on : 04.06.2016

Date of Testing : 08.06.2016

Total Wt. of Aggregates in gms= **5000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS :383-1970 (RA- 2007)	
		Graded	Single Sized
40	100	100	100
20	96.80	95-100	85-100
10	32.80	25-55	0-20
4.75	5.80	0-10	0-5

* Information is furnished by the Customer/Representative

Remarks : This sample is under Graded specific limits

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Job No.: CTCE/BBMP/W.No.06/RN /STEEL/2016-17 20.06.2016

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
Name of the Work	:	Improvements to Roads and at Sarayipalya Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	:	BBMP/EE/BTP/WO/15/2016-17 Dated: 30.04.2016
Date of Test	:	20.06.2016
Technical Reference	:	IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm^2	Tensile strength (Ultimate stress) N/mm^2	Elongation percent gauge length		
1	12	0.89	515	558	13.25	O.K	O.K

AE-06 n/a 004 4.8.16

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Job No.: CTCE/BBMP/W.No.06/RN /STEEL/2016-17 20.06.2016

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
Name of the Work	:	Improvements to Roads and at Sarayipalya Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	:	BBMP/EE/BTP/WO/15/2016-17 Dated: 30.04.2016
Date of Test	:	20.06.2016
Technical Reference	:	IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm^2	Tensile strength (Ultimate stress) N/mm^2	Elongation percent gauge length		
1	16	1.58	520	563	13.40	O.K	O.K

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Job No.: CTCE/BBMP/W.No.06/RN/CSR-06/057m/CUBE/2016-17 20.07.2016

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

*** Customer** : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.

*** Name of the work** : Improvements to Roads and at Sarayipalya Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.

*** Reference** : BBMP/EE/BTP/WO/15/2015-16 Dated: 30.04.2016

*** Sample ID** : Culvert Deck Slab Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

*** Grade of Concrete** : M_{20}

Compressive Strength as on : 28th day

Sample Received on : 20.07.2016

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	22.06.2016	20.07.2016	8.247	480.6	21.36
2	22.06.2016	20.07.2016	8.315	495.5	22.02
3	22.06.2016	20.07.2016	8.475	506.3	22.50

* Information is furnished by the Customer/Representative

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Job No.: CTCE/BBMP/W.No.06/RN/WMM/Gradation/2016-17 11.07.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

Agency : **Mr. R. Nithin,**
No.58, Muneshwara Layout, 5th cross, Bangalore - 91.

Name of Work : Improvements to Roads and at Sarayipalya Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.

Reference : BBMP/EE/BTP/WO/15/2016-17 Dated: 30.04.2016

Date of Testing : 11.07.2016

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **7765**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	155	155	2.0	98.0	95-100
22.4	2450	2605	33.5	66.5	60-80
11.2	1210	3815	49.1	50.9	40-60
4.75	1080	4895	63.0	37.0	25-40
2.36	990	5885	75.8	24.2	15-30
0.600	850	6735	86.7	13.3	8-22
0.075	680	7415	95.5	4.5	0-8

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Job No.: CTCE/BBMP/W.No.06/RN/WMM/AIV/2016-17 11.07.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
Name of the Work	Improvements to Roads and at Sarayipalya Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	BBMP/EE/BTP/WO/15/2016-17 Dated: 30.04.2016
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	11.07.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	79	80	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	302	
4	Aggregate Impact value = percent fines	20.79	20.94	
	100* (W_2/W_1)%			20.87

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.06/RN/WMM/S-T/2016-17 11.07.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
Name of Work	Improvements to Roads and at Sarayipalya Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	BBMP/EE/BTP/WO/15/2016-17 Dated: 30.04.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	11.07.2016

Result : Flakiness Index = **12.85%**

Elongation Index = **13.56%**

Result : Combined Flakiness & Elongation index 26.41%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No.06/RN/CSR-06/057M/QB/2016-17 14.07.2016

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*CUSTOMER	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
*NAME OF THE WORK	:	Improvements to Roads and at Sarayipalya Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE	:	BBMP/EE/BTP/WO/15/2016-17 Dated: 30.04.2016
*SAMPLE ID	:	Bitumen
DATE OF SAMPLING	:	12.07.2016
DATE OF TESTING	:	14.07.2016

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	84	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	45	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	298	Min. 220

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Job No.: CTCE/BBMP/W.No.06/RN/SDBC/Bit/2016-17 16.07.2016

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC:SP:-1984

CUSTOMER	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
NAME OF THE WORK	Improvements to Roads and at Sarayipalya Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/EE/BTP/WO/15/2016-17 Dated: 30.04.2016
SAMPLE I/D	Roads in Sarapriya Layout Ward No.06.
DATE OF TESTING	16.07.2016

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	474	474
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	26	26.00
7. Bitumen content in %	5.20	5.20
8. Average	**5.20**	

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Job No.: CTCE/BBMP/W.No.06/RN/SDBC/Bit/2016-17 16.07.2016

BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
NAME OF THE WORK	Improvements to Roads and at Sarayipalya Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/EE/BTP/WO/15/2016-17 Dated: 30.04.2016
SAMPLE I/D	Roads in Sarapriya Layout Ward No.06.
DATE OF TESTING	16.07.2016

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	26.33	5.55	5.55	94.45	90-100
4.75	258.9	54.62	60.18	39.82	35-51
2.36	52.32	11.04	71.21	28.79	24-39
1.18	41.22	8.70	79.91	20.09	15-30
0.3	33.15	6.99	86.90	13.10	9-19
0.075	30.25	6.38	93.28	6.72	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	25.56	5.39	5.39	94.61	90-100
4.75	268.5	56.65	62.04	37.96	35-51
2.36	35.26	7.44	69.48	30.52	24-39
1.18	31.22	6.59	76.06	23.94	15-30
0.3	40.22	8.49	84.55	15.45	9-19
0.075	41.22	8.70	93.24	6.76	3-8

Note:

Þ This test report should not be reproduced except in full, without written approval of the laboratory.

Þ The results indicated above are based on the tests carried out on the samples received in the laboratory.

Þ Any Query regarding the report must be reported within 30 days from the date of testing.

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